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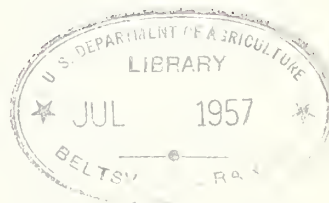
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REPORT
of the
TWELFTH NORTHEASTERN CORN IMPROVEMENT CONFERENCE

New York City
March 1 & 2, 1957

Reported by
Merle T. Jenkins, Secretary



Crops Research Division
Plant Industry Station, Beltsville, Maryland
428CC - April 1957

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REPORT OF THE TWELFTH NORTHEASTERN CORN IMPROVEMENT CONFERENCE

New York City, New York
March 1-2, 1957

Reported by Merle T. Jenkins, Secretary

The meetings of the Twelfth Northeastern Corn Improvement Conference were held in the Henry Hudson Hotel, New York City on March 1 and 2, 1957.

A total of 32 workers representing 11 states, the U. S. Department of Agriculture, 2 Canadian Provinces and 2 producers of open-pedigree hybrids, were in attendance.

AFTERNOON SESSION, MARCH 1

The meeting was called to order by Chairman D. F. Jones at 1:05 p.m. Following introductions, Dr. G. Fred Somers, Administrative Advisor, greeted the conference and indicated that his function toward the Northeastern Corn Improvement Conference was mainly that of maintaining contact with the Directors rather than an official administrative advisor inasmuch as the Conference was not a technical committee.

M. T. Jenkins reported on a survey being conducted by the North Central Corn Breeding Research Committee to determine the use of inbred lines developed by the Agricultural Experiment Stations and the U. S. Department of Agriculture in the hybrid seed corn industry. A questionnaire is soon to be distributed from the office of Mr. William Heckendorn, Executive Secretary, American Seed Trade Association asking for information on the use of inbred lines released by the Agricultural Experiment Stations and the U. S. Department of Agriculture since 1946.

Chairman Jones appointed a nominating committee consisting of R. S. Snell, Chairman; H. M. Yegian and R. G. Wiggans.

The first part of the afternoon session was devoted to special reports by F. Dimmock, H. T. Stinson, Jr., J. G. Buchert, G. H. Stringfield, and J. M. Barnes. Brief summaries of these reports are given below.

BEHAVIOR OF MALE STERILE SINGLE CROSSES IN DIFFERENT LOCATIONS
Fred Dimmock

Eighteen commercial male sterile single crosses were grown in duplicate rows at three locations in Ontario, Ottawa, Guelph and Harrow, to study their behavior and observe differences which might be attributed to environment.

A brief summary of the data obtained on anther extrusion is presented in the following table:-

<u>Summary - percentage of plants which extruded anthers</u>				
	<u>Station</u>		<u>Male Sterile No.</u>	<u>Total</u>
0.0-2.0 o/o	Ottawa	- -	9, 11, 14, 15, 16, 17, 18	7
	Guelph	- -	- 11, 14, 15, 16, 17, 18	6
	Harrow	1 2	9, 11, 14, 15, -- 17, 18	8
2.1-5.0 o/o	Ottawa		1, 2, 10	3
	Guelph		1, 9,	2
	Harrow		10, 16,	2
5.1-20.0 o/o	Ottawa		6	1
	Guelph		2, 10	2
	Harrow		6	1
20.1 o/o & over	Ottawa		3, 4*, 5*, -, 7*, 8*, 12, 13	7
	Guelph		3, 4*, 5*, 6, 7*, 8*, 12*, 13*	8
	Harrow		3, 4*, 5*, -, 7*, 8*, 12*, 13*	7

* above 50 percent.

The data show that the behaviour of the male steriles was quite consistent at all three stations. They are divided largely into two main groups, namely those below 2.0 percent and those above 20 percent.

Where pollen was shed, the plant was selfed to determine viability of the pollen. The results indicated variation from completely sterile to completely normal pollen. Anther extrusion varied from very few to normal extrusion. Where pollen was produced the amount ranged from a few grains to normal abundance.

POLLEN STERILITY AND RESTORATION

H. T. Stinson, Jr.

In 1955 and 1956 F₂ progenies of several restored single crosses involving C106T, WF9T, 38-11T, KysT, and K4T as sterile seed parents, and Ky21, Tx127c, and NC77 as restorers were grown. The F₁ single crosses were completely restored in all cases. Seeds from the same lots were grown in the two years. There was a definite seasonal difference in these F₂ progenies. All families showed a higher proportion of fertile plants

in the more favorable growing season of 1956. The degree of restoration was also influenced by the particular restorer and sterile inbred involved. The two restorer inbreds Ky21 and Tx127c when used on the same sterile inbreds (Cl06T, WF9T, 38-11T) showed different restoring abilities. Combining the results from the six families for the two years reveals that Ky21 gave 70 percent and Tx127c 58 percent fertile plants in F_2 . Used on KysT and K4T, the restorer NC77 gave 82 percent fertile plants in F_2 .

The three sterile inbreds also behaved differently when restored by the same restorer line. Again for the two years, Cl06T restored by either Ky21 or Tx127c gave a larger proportion of fertile plants in F_2 than WF9T or 38-11T. The latter two sterile inbreds were restored to about the same degree by the two restorers for the two years. However, in 1955, WF9T combinations gave higher proportions of fertile plants in F_2 than 38-11T.

That different numbers of genes are involved in pollen restoration in various inbreds is also indicated by backcross ratios obtained in converting standard inbreds to restorer lines. The conversion has been accomplished by crossing restored sterile plants as pollen parents to the sterile version of the inbred. Some examples may be cited. The inbreds Al58T, Cl03T, and K4T (187-2) restored by Ky21 segregate 1 fertile; 1 sterile on backcrossing, and 3 fertile; 1 sterile on F_2 , indicating a single dominant gene for restoration. The inbred WF9T restored by either Ky21 or Il53 has given backcross ratios approaching 1 fertile; 3 sterile, and F_2 ratios close to 8 fertile: 7 sterile. This suggests two dominant genes acting in a complementary way. In contrast to WF9T is the behavior of HyT restored by Ky21, C236 and Tx127c, where on both backcrossing and selfing an excess of fertile plants has been obtained. The combined data for 11 backcross families grown in 1956 show 108 fertile plants and 39 sterile plants, and data from 8 F_2 families give 109 fertile and 7 sterile plants. These limited results fit closely 3 fertile: 1 sterile, and 15 fertile; 1 sterile, respectively, suggesting duplicate dominant genes, either one of which can restore HyT.

These observations on pollen restoration indicate that the various restorers may differ in genotype with respect to restoration; as seen when different restorers are used on the same sterile inbred, and that different inbreds with the same source of sterile cytoplasm influence differently the degree of restorations as seen when various sterile inbreds are combined with the same restorer. Thus, both parents can play a role in restoration; and the degree of restoration is influenced by growing conditions. This calls for careful testing of individual restored sterile combinations over a representative range of possible growing conditions.

SWEET CORN RESTORERS
J. G. Buchert

Many sweet corn lines can be found which restore cytoplasmic male sterile lines to some degree. Many of these, however, accomplish this very poorly and therefore could not be used in a commercial program. Others appear to be excellent in their ability to restore Texas type sterility.

A few of the poor restorer sources are listed below:

- C8 - this gives varying degrees of poor restoration. At least half of the plants have been fertile. It has only been tested on T.
- P39 - this has restored both T and S types of sterility. Segregating cultures have given plants varying in degree of restoration from almost completely fertile to completely sterile. It has not restored the one line of S type on which it was tested.
- Mass.21547 - this restored C68S but did not restore C53S, C53T, or Ill. 101T.
- Gem - this has restored a few different lines of T type.
- P14 - P39-1CTA T and P38-M94 T have been restored by pollen from plants carrying the P14 restorers. Restored plants in segregating progeny exhibit many degrees of fertility; some may have a sterile main stem with almost completely fertile tillers. Ill. 101T was not restored (one ear culture observed). It did not restore one line of S.

Very good restorer genes have been found in the following lines:

Wisc. 5 - Ia5125 x Wisc. 5 yielded all completely fertile plants.

YV (Yellow Vanguard) - Ia5125T x YV gave all completely fertile plants

NJ 143y - a culture of Cl3T x NJ 143y (received from W. H. Lachman) contained all fertile plants. The degree of restoration was more variable than that exhibited by the other good restorers listed here. This may have been due to different environmental conditions.

NJ hybrid 103 (hybrid of P39 x 7y) - this hybrid is heterozygous for the restorer gene(s). Thirteen lines containing T type cytoplasm have been completely restored. A single dominant gene difference appears to be responsible for the restoration. There is an indication that a seedling-vigor factor is linked with this gene.

At the Connecticut Station these restorers are being used to convert many sterile inbreds to restorers.

Oscar H. Pearson reported that restorers are very scarce in sweet corn. He indicated that he had tested some of the older sweet corn varieties and had found a few good restorers.

Chairman Jones reported that the situations in sweet corn and field corn are very similar with respect to restorers except that there are fewer restorers in sweet corn. He indicated that it is possible to classify good restorers by watching the central spike of the tassel. The anthers first appear in a portion below the center of the central spike and spread from here in each direction. Any deviation from this and any delay in the appearance of anthers beyond that of the silks should be viewed with suspicion with respect to restorers. He felt that good fertiles and good restorers can be identified rather accurately in the above manner.

G. H. Stringfield asked whether the central spike could be sterile and the rest of the tassel fertile.

Chairman Jones replied, yes, but this is a form of partial sterility and needs watching.

ADJUSTING FIELD PLOTS TO THEIR ADJACENT AND DISTRIBUTED CONTROLS G. H. Stringfield

The study began with linearly placed items restricted to provide that each item has equal adjacency with respect to every other item. This led to a field design and a simple computation method for adjusting the mean performance of 2-row corn plots in two-fold replication to the difference between the mean performance of their 8 adjacent (nearest) plots and the mean performance of the 8 distributed replicates of the adjacent plots. The method was shown to have materially reduced the variation between means in uniform plantings compared with randomized blocks. No method for obtaining good estimates of error for the adjusted means has been established.

INFLUENCE OF N, P, and K ON THE SEVERITY OF CORN SEEDLING BLIGHT J. M. Barnes

Two single-cross corn hybrids (N.Y.3 x Id.D50 and Oh51A x Io.B8) were tested for the degree of correlation between their seedling reactions in infested quartz sand at sub-optimal temperatures and their known mature plant reactions to attack by the fungus Gibberella zeae. Varying amounts of N, P, and K in nutrient solution were given to the seedlings in a study of the effect of these elements upon the severity of blight.

Disease reactions of the seedlings used conformed to their known mature plant stalk rot reactions. High nitrogen favored seedling blight when furnished alone, or in combination with high phosphorus and potassium. Growth of G. zeae in artificial nutrient cultures showed a similar response to nitrogen. Seedlings grown with high potassium looked best in general, although there was no statistical significance.

The high degree of correlation between the seedling disease reaction and the known mature plant disease reaction suggests that seedling tests might be used in predicting the stalk rot reactions of mature corn plants. Many selections must be carefully tested before the validity of such a program can be determined.

Chairman Jones adjourned the meeting at 3 o'clock so as to provide opportunity for standing committees to meet and conduct their business.

EVENING SESSION, MARCH 1

Following dinner in the West Room of the Henry Hudson Hotel, Chairman Jones introduced Mr. S. B. Yates, Director, Patent Development Division, Research Corporation who presented general information on Research Corporation, the Jones patent and outlined some of their thinking in the application of the patent.

Research Corporation is a non-profit foundation organized by Dr. F. G. Cottrell in 1912 who endowed it at that time with his patent rights in the field of electrical precipitation. Dr. Cottrell was a chemist and his ideas in organizing Research Corporation were to provide a means for advancing science by contributing to scientific and educational institutions, provide a means for handling inventions more readily than had been possible in the past and to distribute the proceeds for the support of scientific research.

Research Corporation now has arrangements with more than 90 universities and research institutions for handling patent arrangements. In general, Research Corporation gets about $42\frac{1}{2}$ percent of the royalties. The remaining $57\frac{1}{2}$ percent goes to the research agency with some of this going to the inventor.

In 1935 Dr. R. R. Williams and Dr. R. E. Waterman assigned certain patents covering the synthesis of vitamin B1 to Research Corporation and set up a fund known as the Williams-Waterman fund for the endowment of research in the field of nutrition. Total grants of this fund have been somewhat in excess of one million dollars per year.

Mr. Yates indicated that in 1949 D. F. Jones and P. C. Mangelsdorf came to Research Corporation with plans for patents on the use of cytoplasmic sterility in the production of hybrid seed corn. Two patents,

one covering the use of cytoplasmic sterility and another on the use of restorers were assigned to Research Corporation. The arrangements provide for distribution of any royalties between Drs. Jones and Mangelsdorf, the Connecticut Agricultural Experiment Station, Harvard University and Research Corporation. Part of Research Corporation's funds go to an Edward Murray East fund to be administered in the same general manner as the Williams-Waterman fund. The Edward Murray East fund is to be administered by a committee of three, one member to be appointed by Jones, one by Mangelsdorf and the third by Research Corporation.

Patent No. 2,753,663, covering the use of restorers, was granted on July 10, 1956. The patent covering the use of cytoplasmic sterility has not yet been granted. An appeal on the application for this patent is to be heard before the U. S. Court for the District of Columbia about a year from now. Research Corporation has in mind establishing a licensing arrangement in which about 20 to 25 percent of the savings through the use of cytoplasmic sterility and restorers would be paid as a royalty by the seed producer. He indicated that Research Corporation hopes to announce a definite policy on licensing sometime within the next month. He indicated that they have had conversation with many people in Research and Industry regarding royalties but have been thinking in the general terms of a royalty of 5¢ per bushel for each patent. Mr. Yates indicated that this is their first experience with a process patent in this general field and Research Corporation is proceeding with considerable caution developing their licensing policy.

Following Mr. Yates presentation he was questioned in considerable detail regarding various procedures and policies. In these discussions it was brought out that both Dr. Jones and Mr. Yates felt that the patent was sufficiently broad enough to cover the use of an F₂ pollinator. New York indicated that they plan to distribute seed stocks for the production of NE310, a new three-way hybrid utilizing both cytoplasmic sterility and a restorer for seed production in 1957. They were interested in learning what arrangements their prospective seed growers would be required to make with Research Corporation. Mr. Yates indicated that he would be glad to have them write him regarding licensing and hoped that Research Corporation would have their licensing policy developed in the near future.

C. C. Wernham gave an illustrated lecture on South Africa based on his observations during a recent stay of six months in that country while on sabbatical leave. Dr. Wernham discussed general agricultural conditions in South Africa, and presented information on corn production and on the corn disease situation with particular reference to the leaf blight caused by Helminthosporium turcicum. Following his discussion Dr. Wernham showed colored slides taken in South Africa. The moving picture "The Great Story of Corn" was shown as the last item on the program.

MORNING SESSION, MARCH 2

The meeting was called to order by Chairman Jones at 9 o'clock. The Chairman then called for reports of the various standing committees. These reports follow:

REPORT OF THE SWEET CORN COMMITTEE

The Sweet Corn Committee expanded and coordinated its activities through development of a regional project, NE32. In 1956, there were nine Northeastern Experiment Stations and two cooperating agencies which conducted the sweet corn activities.

A regional sweet corn trial with twenty hybrids in three maturity classes was conducted. Although no single hybrid was outstanding in all respects at all locations, several showed high adaptability throughout the region.

Breeding projects and objectives were reviewed and integrated. Several stations have active projects developing new inbreds with sterile cytoplasm and are screening for fertility restoration. One station is studying linkage relationships of restorer genes.

Very extensive bacterial wilt screening was conducted on inbreds and hybrids utilizing several methods of artificial inoculation. Selection for increased resistance was possible in some inbreds.

Plans were developed for regional uniform trials for 1957 and for handling data on the electronic computer.

A mimeographed summary of the regional hybrid trial may be obtained from Dr. B. L. Pollack, Pennsylvania State University.

It was the opinion of the Sweet Corn Technical Committee, on consultation with Dr. Jenkins, that the Sweet Corn Committee of the Corn Conference should be dissolved since its functions have been taken over by the Technical Committee. We certainly wish to retain our interest and association with the Corn Conference.

Executive Committee NE32

Wm. Lachman, Chairman

R. S. Snell

R. G. Rothgeb

R. M. Bailey

M. T. Lewis

D. W. Barton, Secretary

Dr. Barton MOVED: That the Sweet Corn Committee of the Northeastern Corn Improvement Conference be dissolved.

Seconded and passed.

PROGRESS REPORT ON STALK ROT
J. C. Anderson

The seriousness of stalk rot (Gibberella zeae) can be assumed since we are giving considerable time for discussion of its nature, its cause and its control.

A lengthy discussion by the committee on Diseases and Insect Pests brought to light many questions which, though not answered, may stimulate more progress in our several research programs. Many facts brought enlightenment to this difficult problem. The more significant ones are listed below.

A. Cultural Methods of Control.

1. An unbalance of too much N in proportion to the K increased stalk rot.
2. A high chlorine content in corn leaves was coincident with decreased stalk rot.
3. Planting corn so it will mature later in the fall will decrease stalk rot.
4. Midseason maturities offer greatest difficulties in stalk rot.

B. Nature of the Disease.

1. It is a senility or old age disease.
2. The presence of an inhibiting factor has been demonstrated in susceptible inbreds. This disappears about 10-14 days after pollination. In resistant ones time is much longer.
3. Some of the committee could not repeat success of inoculation of excised sections of corn stalk with Gibberella zeae.
4. There is evidence that the organism enters culm thru rotting adventitious buds. Gibb. zeae isolated earliest from nodes rather than internodes.
5. Gibberella zeae may disintegrate pith but not necessarily the rind.
6. What is possible role of various fungi found in association with Gibb. infested stalks?

C. Breeding for Resistance.

1. Inoculation technique

Time - successful inoculations are made at least 3 weeks after pollination.

Position - where is most satisfactory place?

Method - probably not in itself the limiting factor in success of inoculations.

2. Sources of resistance - anything that has been found to have satisfactory resistance.
3. Linkage or association of other morphological, physiological, or chemical characteristics.
4. Should both *Diplodia* and *Gibberella* be selected against at the same time?
5. Would recombination of U.S. 13 (WF9 x L317)x(Hy x 38-11) give more or less stalk rot than standard combination?

In a post adjournment conference, New Jersey and Maryland agreed to a limited testing program of these inbreds. They are to be planted in both states and at 2 or 3 dates.

A374	K148
A295	Mass.Wis.9
A73	MS206
B6	M14
B8	Oh07
B9	Oh51A
B10	Oh28
B2	Oh43
B14	Oh45 red cob
B36	Oh45 white cob
C103	Oh51
CI.28A	Pa70
CI.42A	Pa33
I159L1	W22
I205	WF9
	W153A
	T8

L. L. Huber further emphasized the importance of stalk rot to the corn program in the Northeast region and indicated he would favor an expanded program of breeding for stalk rot resistance.

O. H. Pearson reported that the dividing point on stalk rot ratings is at 25 percent kernel moisture. Above this moisture content there are a few differences in stalk rot and below it there usually is good differential reaction.

J. C. Anderson MOVED: That a committee be appointed to consider and get started on a program of stalk rot.

Motion was seconded by L. L. Huber and passed.

G. H. Stringfield mentioned that the Toledo Corn Borer Laboratory had turned over about 150 lines screened for corn borer and should be included in any group of lines that should be screened for stalk rot.

REPORT OF THE COMMITTEE ON THE REGISTRATION OF NE HYBRIDS

A motion was passed at the 1956 meeting of the Conference substituting "NE" for "Eastland" as the regional designation for Northeastern hybrids provided it met with the approval of the Northeastern Directors. Director G. Fred Somers polled the Directors of the Northeastern Stations for their approval of this change. On December 28, 1956 he wrote the Secretary as follows:-

"As yet, I have not heard from one Station, but all of the others have given their approval of this recommendation. In view of this, I think it is satisfactory for the Conference to go ahead with the proposed change of designation."

The Committee recommended the registration of three new hybrids for NE designation. These three hybrids were approved and accepted by the Conference. They are as follows:

- NE 310 - New York Experiment Stations X3.
Pedigree (Oh51A-T x B8) x NY16
- NE 420 - Massachusetts Experiment Station
Pedigree (Pa11 x Pa54 (Ny3 x Q83)). This hybrid combines the seed parent of Pa.444 with the pollen parent of Mass. 63.
- NE 912 - Eastern States E12
Pedigree (Cl03 x Cl.7) (Oh7 x Cl.21E)

All hybrids have been tested for two or more seasons and in more than one State and have shown superiority in one or more respect with the widely grown hybrids in the same season. The descriptions of the hybrids and summaries of the data on their performance follow this report.

D. F. Jones, Chairman
L. L. Huber
R. G. Rothgeb

DESCRIPTION AND PERFORMANCE OF NE310
(Formerly Cornell X-3)

Pedigree: (Ohio 51A^T x B8) x NY 16

Description: This is a tall-growing, yellow-grained, early 3-way hybrid with a slender stalk and ear. It is adapted to short season areas such as high elevations and Northern New York.

Performance: The following data are averages of 11 early grain trials during a 3-year period, 1954-1956:

	<u>Yield</u>	<u>Percent Water in Harvested Ears</u>
Cornell X-3	82.1	38.2
Michigan 250	83.5	40.4
Cornell M-4	84.9	42.7

* Bushels shelled grain per acre at 15⁰/o moisture

Stalk rot Resistance*
(Average of 8 trials in 1954-56)

Cornell X-3	7.2
Michigan 250	7.4
Cornell M-4	7.8

* Relative rating with the higher number being the most resistant.

Maturity: If it is assumed that grain corn loses an average of 0.5 percent moisture per day after reaching physiological maturity, X-3 is about 4-6 days earlier than Michigan 250 and 7-10 days earlier than Cornell M-4. It is likely that the slender ear aids this hybrid in fast drying in the fall.

Yield: Approximately the same as Michigan 250 and Cornell M-4 in short-season areas.

Standability: Not quite as good as M-4 and Michigan 250 in short-season areas. In areas where M-4 is well adapted, X-3 has much poorer standability.

Smut Resistance: As good as M-4, and Michigan 250.

Seed Production: In producing Cornell X-3, a cytoplasmic male sterile single cross (Ohio 51A^T x B8) is used as the seed parent. The pollen parent, NY 16, has a genotype capable of restoring full pollen production to the three-way hybrid. Thus, detasseling in the production of the hybrid seed for commerce is completely eliminated and the necessity for seed blending to obtain the necessary male-fertile plants in the farmers' fields is not required.

DESCRIPTION AND PERFORMANCE OF NE420
(Formerly a Massachusetts Experimental)

Pedigree: (Pa11 x Pa54) x (Q83y x NY3) Q83y is a yellow sub-line from Q83 red.

Description: This is a yellow-grained early double cross. It has heavy, medium height stalk and medium size ears about 4 feet from the ground. It is very similar to Pa444 in appearance and adaptation.

Performance: 1956 data

Location	NE420			Pa444		
	Bu/A	%H ₂ O	%erect	Bu/A	%H ₂ O	%erect
Atlantic, Pa.	42	28		32	30.5	
Renfrew, Pa.	83	21.9		70	21.6	
	87	23.2		77	23.0	
Walpole, N.H.	84	29.0	24	86	30.6	0
Woodstock, Conn.	67	26.2		45	25.2	
	73	25.4	5	70	24.9	18
Mt. Carmel, Conn.	56	22	76	66	22	89
Feeding Hills, Mass.	73	25.1		82	24.5	
	89	24.3	0	83	23.3	0
Cayuga County, N.Y.	97	37.7		101	37.7	
Amherst, Mass.	100	34.9		--	----	
Av. of 10 tests excluding Amherst	75.2	26.3		71.2	26.3	
Av. of all tests	77.4	27.1		71.2	26.3	

Maturity: About same maturity as Pa444 (Pa11 x Pa54)x(Pa32 x Pa33)

Yield and Standability: Somewhat better than Pa444

Seed Production: The silk of the seed parent appears about the same time as the pollen from the male parent is shedding.

DESCRIPTION AND PERFORMANCE OF NE912
(Formerly Eastern States Exp. 12)

Pedigree: (C103 x CI.7) x (Oh07 x CI.21E)

Description: Exp. 12 is a tall growing, yellow grained, full season hybrid (900 maturity) with heavy stalks, and brace roots, broad dark green leaves, and better than average resistance to both *H. turcicum* and *H. maydis*. It is adapted for grain production in the southeasterly areas of the northeast, specifically Delaware, eastern Maryland, southeastern Pennsylvania, and southern New Jersey.

Maturity: This experimental hybrid is identical in maturity to Conn. 845 and two to three days later than U.S.505.

Drought tolerance: Comparisons under severe drought conditions at Federalsburg, Maryland in 1954 and 1955 indicate superior drought tolerance.

Eastern States Data:

Variety	Bu/A	1954			Bu/A	1955		
		o/o H ₂ O	o/o Erect	o/o Barren		o/o H ₂ O	Root Lodged	o/o Barren
U.S.505	31	21.4	60	49	33	23.6	39	37
Conn.845	37	24.8	56	34	41	23.3	25	32
E.S.Exp.12	54	24.3	53	17	54	21.8	34	19
5 o/o Sig.LSD	13	----	NS	14	13	---	NS	12

Extracted from 4 x 14 randomized block.

Seed Production: Either single cross may be used as a seed parent without split planting. The (C103 x CI.7) tends to produce a thick flat kernel which may be considered undesirable, but the percentage of flats is good. (Oh07 x CI.21E) has been used to a very limited extent as the seed parent with satisfactory results.

General Performance:

Connecticut, New Haven AES Data (1956) Mt. Carmel:

Variety	o/o Broken	Days to Silk	o/o H ₂ O	Bu/A
E.S.Expt. 12	3	75	37	61
Conn. 845	8	75	37	37
U. S. 505	10	72	39	35

General Performance:

Eastern States Data:

Variety	4 year average			1956			1955			1954			1953		
	Bu/A	H2O	o/o Erect	Bu/A	H2O	o/o Erect	Bu/A	H2O	o/o Erect	Bu/A	H2O	o/o Erect	Bu/A	H2O	o/o Erect
Conn. 845	67	23.2	51	106	22.4	14	64	23.4	33	42	23.1	61	54	23.7	95
U.S. 505	73	21.4	56	115	20.4	28	63	21.3	42	48	21.8	56	67	22.2	97
E.S. Exp. 12	84	22.4	51	131	21.4	19	74	21.7	34	63	23.8	57	68	22.6	91

Average of Georgetown, Del., Federalburg, Md., and Delmar, Del., in all years.
In addition data from Middletown, Del., is included in 1956 and 1953; data from Greencastle, Pa., is included in 1955 and Parkton, Md., data included in 1954.

Maryland AES 1956 Data:

Variety	College Park		Trappe	
	Bu/A	o/o Broken	Bu/A	o/o Broken
E. S. Expt. 12	131.3		126.3	29
U. S. 505	116.3		119.7	31
Conn. 845	128.4		118.1	55

New Jersey AES 1956 Data:

Variety	Average of Three Locations			
	Bu/A	o/o H2O	o/o Broken	Bird Damage Index
E. S. Expt. 12	107	30.9	12	1.5
N. J. 10	103	30.2	18	12.0
DeKalb 837	94	29.3	11	3.0
N. J. 8	90	29.0	14	1.0

REPORT OF THE COMMITTEE ON UNIFORM TESTS OF 200 MATURITY

Of the 45 single cross combinations made in 1955, sufficient seed was produced to supply the following for prediction test purposes:

Single Crosses

R. M. Bailey, University of Maine, Orono, Maine	43
D. L. Matthews, Eastern States Farmers' Exchange West Springfield, Mass.	26
R. G. Wiggins, Cornell University, Ithaca, N. Y.	36
F. Dimmock, Central Experiment Farm, Ottawa, Canada	45

Prediction Tests, 1956

Maine - unfavorable season, data not very satisfactory for prediction use.

Vermont - (E.S.F.E.) unfavorable season, data of little value.

New York - good data, suitable for prediction use.

Ottawa, Canada - good reliable data, suitable for prediction use,
test data sent to Dr. Huber for summary purposes.

Double-cross seed production, 1957

Arrangements will be made to produce seed in 1957 of double-crosses of predicted superior performance, for testing in 1958.

F. Dimmock, Chairman
R. M. Bailey
R. I. Brawn

REPORT OF THE COMMITTEE ON UNIFORM TESTS OF 300-500 MATURITY

L. L. Huber reported that no tests of these maturities were conducted in 1956 and nothing is being planned for 1957.

REPORT OF THE COMMITTEE ON UNIFORM TESTS OF 600 and 700 MATURITY

D. F. Jones reported that the committee had sponsored no tests of this maturity in 1956 and nothing was planned for 1957.

REPORT OF THE COMMITTEE ON UNIFORM TESTS OF 800 and 900
MATURITY

Two uniform tests of 3-way crosses utilizing WF9 x Oh43 and WF9 x Oh51A were sponsored by the Committee in 1956. The data from these tests are summarized in tables 1 and 2. No yield tests are planned for 1957. The season will be utilized for observational plantings.

J. C. Anderson, Chairman
R. G. Rothgeb

Table 2. Summary of 1956 Northeast Cooperative 3-way crosses with WF9 x Oh51A as tester.

[illegible]

REPORT OF THE COMMITTEE ON POLLINATING SUPPLIES

A cooperative purchase of 350,000 3" x 8" wet strength glassine silk bags constructed with waterproof adhesive throughout was made for conference members in 1956 from the Carter Paper Company.

The Breakdown of this order was as follows:

Connecticut	15M
New Jersey	100M
Massachusetts	10M
Eastern States Farmers'	
Exchange	225M
TOTAL	350M

Members involved will recall a hectic June where the original shipment as received by Eastern States was tested and found to be unsatisfactory. The Carter Paper Company reported that a minor change in wet strength glassine paper was required by the supply situation. The surface of the substituted paper was more glossy and the waterproof adhesive used proved unsatisfactory. The supplier replaced the entire order, and the bags were in purchaser's hands barely in time. Aside from a month of anxiety awaiting delivery, however, this first cooperative purchase of pollinating needs proved satisfactory according to reports received.

Bids on tassel bags, 7" x 4 3/4" x 15 1/2", 40# wet strength Kraft constructed with waterproof adhesive throughout, have been received for 1957 purchase. Orders from conference members have been solicited to assemble a cooperative purchase this year.

The committee recommends that the conference organize the purchase of a two year supply of tassel bags in 1957. Alternating, then, annually between tassel bags and silk bags. The two year supply will provide significant savings through volume, as well as to hedge against supply shortage.

H. L. Everett
Robert S. Snell
D. L. Matthews, Chairman

REPORT OF THE COMMITTEE ON NOMENCLATURE OF CYTOPLASMIC STERILITY

D. F. Jones, Committee Chairman, reported that the committee had taken no action during the past year.

REPORT OF THE COMMITTEE ON DISEASE AND INSECT PESTS

C. W. Boothroyd and J. W. Barnes of New York reported germination tests on 2 hybrids, slurry treated with Arasan, Orthocide and Phygon and each in combination with the insecticide Lindane. After 2 years in commercial storage all untreated seed showed 40 to 50 percent reduction in stands whereas treated seed germinated well in cold tests with little difference between treatments. Retreatment after one year resulted in increased stands on all fungicide-insecticide combinations.

Field comparisons of KCl, K_2SO_4 , KPO_3 , gave a significant reduction in stalk rot only when K was in the chloride form.

Gibberella zeae was recovered from basal stalks and roots in late June but not in numerous colonies (50 percent of the isolates) until October. G. fujikwai showed a gradual numerical increase up to 25 percent of the isolates in November. A Trichoderma sp. was recovered readily in June and July but was reduced to about 10 percent of the isolates at the end of the season.

Cold testing in soil samples taken at weekly intervals showed a gradual decline in the ability of soil-borne pathogens to attack corn seeds and seedlings from June through early September.

C. C. Wernham of Pennsylvania defined the objective of the plant pathologist as the production of inbred lines with a broad spectrum of disease resistance. A minor objective is to improve the performance of CI.29 cold tolerance and resistance to H. maydis seems to be the more difficult feature to bring under control. The cool wet weather of 1956 was accompanied by extensive root rot making possible the elimination of many susceptible things among advanced generation inbreds. "Our research efforts appear to be most consistent when we devote our efforts to inbreds of 110-120 days maturity."

Graydon Kingsland, Pennsylvania, reported that the mid-season loss of the lower 4 or 5 corn leaves results in a higher incidence of stalk rot. He suggests the possibility that partial artificial defoliation would be of practical importance in connection with the evaluation of breeding material or hybrids for stalk rot resistance.

C. C. Wernham, Chairman

J. C. Anderson

C. W. Boothroyd

REPORT OF THE COMMITTEE ON PRESERVATION OF OPEN-POLLINATED VARIETIES

No procedure for collecting open-pollinated corn varieties has as yet been formulated by this committee. Some information has been obtained as to the present extent of such collections and possible procedure which may be followed.

Due to the almost universal use of hybrids in most of our areas, it will be difficult to locate seed of open-pollinated varieties. Dr. Jones reported in correspondence, "Although I have written to all of our county agents, so far we have been unable to locate any open-pollinated seed. It is apparent that we have delayed too long making this collection."

Fortunately many collections have already been made and preserved through Regional Plant Introduction programs of NC-7 and NE-9. A recent seed inventory from Dr. Max Hoover, Regional Coordinator of NC-7, lists many pages of domestic maize collections. In recent correspondence Dr. Dolan, Regional Coordinator of NE-9, indicated that he already has on inventory about 70 domestic corn collections from various states, including New York, Pennsylvania, West Virginia, Rhode Island, and Massachusetts. The NE-9 collection also contains a fairly large number from Canada, Turkey, and northern U.S. areas, such as the Dakotas.

If this Conference wishes to sponsor further collection and preservation of domestic open-pollinated corn varieties, one approach would be as follows: collections could be turned over to NE-9 as domestic plant introductions. Dr. Dolan has in recent correspondence stated willingness to accept collections made or sponsored by our Conference.

R. M. Bailey, Chairman

REPORT OF THE NOMINATING COMMITTEE

R. M. Bailey was nominated for Chairman, and L. L. Huber for Vice-Chairman. The secretary to continue.

J. C. Anderson MOVED: That the nominations be closed and the Secretary instructed to cast a unanimous ballot for the nominees.

Seconded and passed.

DISCUSSION OF SPECIAL TOPICS

J. C. Anderson asked for recommendations for hybrids that would be suitable for growing in areas where bird damage is severe.

G. H. Stringfield indicated that he had one hybrid which the Ohio Station was thinking of recommending for growing in bird infested areas. Without protection W64 lost 30 bushels to birds whereas the resistant

hybrid lost about 20 bushels to birds. In Ohio most of the bird damage occurs along Lake Erie. This area may need to grow late hybrids and dry them artificially if the problem of bird damage increases.

D. F. Jones reported that in yield tests early hybrids usually have the least damage. He indicated that Z. I. P., Aldrin and fungicide had prevented bird damage to seedlings.

Ronald Anderson indicated that preliminary trials of spraying the ears: showed some promises of protection against bird damage.

R. G. Rothgeb raised a question as to the weight that should be given to clean husking in selection of hybrids.

L. L. Huber thought that not too much weight should be given to this point. It was agreed that suitability for mechanical harvesting was a characteristic that should be considered in selection.

Meeting adjourned at 12:10 noon.

ROSTER OF ATTENDANCE

Canada

Brawn, Robert I.	Macdonald College	Montreal
Dimmock, Fred	Central Expt. Farm	Ottawa

Connecticut

Buchert, J. G.	Connecticut Agr. Expt. Sta.	New Haven
Jones, D. F.	" "	"
Stinson, Harry T.	" "	"

Delaware

Indyk, Henry W.	University of Delaware	Newark
Rahn, E. M.	" "	"
Somers, G. Fred	" "	"

Maine

Bailey, R. M.	University of Maine	Orono
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Maryland

Jenkins, Merle T.	ARS, USDA	Beltsville
Rothgeb, R. G.	University of Maryland	College Park
Snyder, Robert J	" "	"

Massachusetts

Matheson, Jas. A.	Eastern States Farmers' Exch.	W. Springfield
Matthews, D. L.	" "	" "
Pearson, O. H.	" "	" "
Yegian, Hrant M.	University of Massachusetts	Amherst

New Jersey

Anderson, John C.	Rutgers University	New Brunswick
Cappellini, Raymond	" "	"
Funk, C. Reid	" "	"
Hasting, Desmond	" "	"
Mayes, McKinley	" "	"
Snell, Robert S.	" "	"

New York

Anderson, Ronald	Cornell University	Ithaca
Barnes, J. M.	" "	"
Barton, Donald W.	N.Y. Agr. Expt. Sta.	Geneva
Boothroyd, C. W.	Cornell University	Ithaca
Otto, Harley J.	Cornell University	"
Walden, David B.	" "	"
Wheeler, Donald	" "	"
Wiggans, R. G.	" "	"

Ohio

Stringfield, G. H.	Ohio Agr. Expt. Station	Wooster
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Pennsylvania

Butler, Dan.	Penna. Farm Bureau	Harrisburg
Huber, L. L.	Penn State University	Univ. Park
Wernham, C. C.	" " "	" "

South Carolina

Yarnell, S. H.	USDA Southeastern Veg. Breeding Laboratory	Charleston
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Washington, D. C.

Heerman, Ruben	SESD, USDA	D. C.
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West Virginia

Johnson, Melvin W.	W. Va. University	Morgantown
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OFFICERS AND COMMITTEE MEMBERSHIP, 1957

Administrative Advisor

G. Fred Somers

Executive Committee

R. M. Bailey, Chairman
L. L. Huber, Vice-Chairman
D. F. Jones, Member-at-large
M. T. Jenkins, Secretary

Committee on Registration of NE Hybrids

D. F. Jones, Chairman
L. L. Huber
R. G. Rothgeb

Committee on Uniform Tests of 200 Maturity

F. Dimmock, Chairman
R. M. Bailey
R. I. Brawn

Committee on Uniform Tests of 300-500 Maturity

L. L. Huber, Chairman
R. G. Wiggans
H. M. Yegian

Committee on Uniform Tests of 600-700 Maturity

D. F. Jones, Chairman

Committee on Uniform Tests of 800-900 Maturity

J. C. Anderson, Chairman
R. G. Rothgeb

Committee on Pollinating Supplies

D. L. Matthews, Chairman
R. S. Snell
H. L. Everett

Committee on Nomenclature of Cytoplasmic Sterility

D. F. Jones, Chairman
H. L. Everett
R. S. Snell
G. H. Stringfield

Committee on Disease and Insect Pests of Corn

C. C. Wernham, Chairman
J. C. Anderson
C. W. Boothroyd

Committee on the Preservation of Open-Pollinated Varieties

R. M. Bailey, Chairman

Committee on Stalk Rot

L. L. Huber, Chairman
J. C. Anderson
C. W. Boothroyd

